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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/829,714	04/10/2001	Donald Ray Denton	PARK.P0148US	1788
49458	7590	04/22/2005	EXAMINER	
DON W. BULSON 1621 EUCLID AVENUE / 19TH FLOOR RENNER, OTTO, BOISSELLE & SKLAR, LLP CLEVELAND, OH 44115			CECIL, TERRY K	
			ART UNIT	PAPER NUMBER
			1723	

DATE MAILED: 04/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/829,714

Applicant(s)

DENTON ET AL.

Examiner

Mr. Terry K. Cecil

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 10, 26, 39-46 and 52-65 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-7, 10, 26, 39-46 and 52-65 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

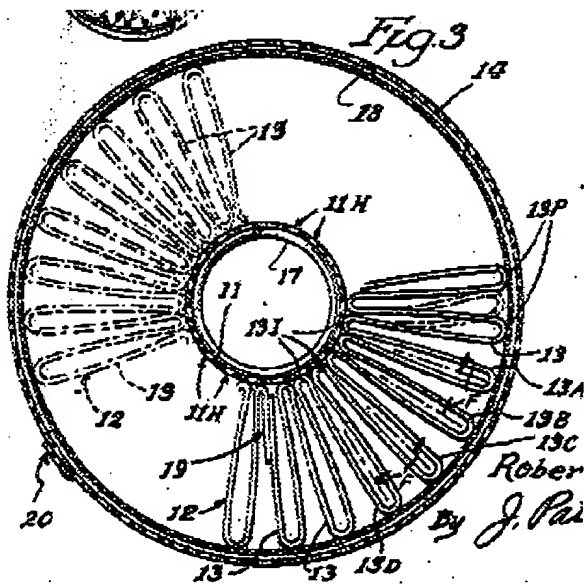
DETAILED ACTION***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
2. Claims 1-3, 10, 53-58 and 64-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over MacDonnell (U.S. 3,506,475) in view of Kahlbaugh et al. (U.S. 6,165,572).



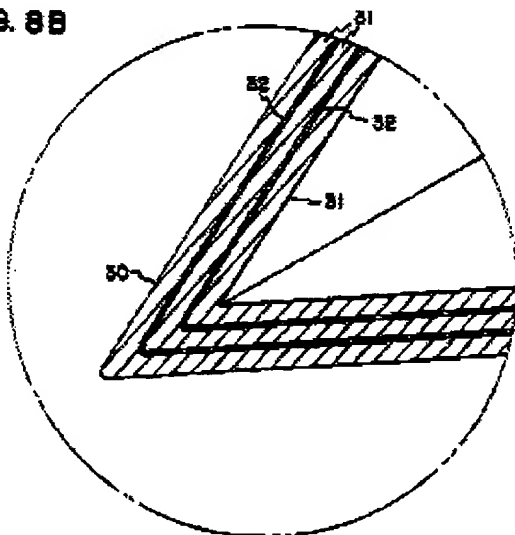
MacDonnell teaches a fuel filter for removing particulates as small as 5 microns or smaller (col. 1, lines 45-46; col. 2, lines 37-38). The filter is cylindrical (figure 1) and includes longitudinally-extending pleats without an endoskeleton for support. An exoskeleton 18 in the form of a netting is attached to each of the outer pleats by an adhesive (col. 5, lines

26-40). The filter includes about 9.2 pleats per diameter inch (60 pleats/6.5 diameter inches, see

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col. 9, lines 26-27). As indicated in col. 9, lines 1-4, the netting 18 is for mechanically-ganging the pleats together and has a large-sized mesh to insure *full flow* action through the filter (it is obvious that such would require at least 50% open flow area to allow for the desired full flow through the filter; the exact flow area percentage is a matter of optimization for the desired filter operating characteristics) [as in claims 1, 10, 57-58, 64 and 65]. The height of each pleat is substantially equal to or less than the difference between the inner and outer diameters of the pleat arrangement.

MacDonnell teaches a pleated form of fibrous sheet material that can be any one of or a combination of materials, including cotton, wood or synthetic fibers; but he does not teach a fiberglass (or polymer) filtration layer sandwiched between inner and outer layers of non-woven polymer.

FIG. 8B

However, Kahlbaugh teaches a multi-layer fibrous pleated media for filtering gases or liquid including fuel (col. 4, lines 48-52; col. 29, lines 25-56), wherein any of the inner layers are sandwiched between adjacent layers and wherein the layers are made of nonwoven polymer fibers (e.g. polypropylene or polyamide) or fibers of glass (col. 16, lines 61-

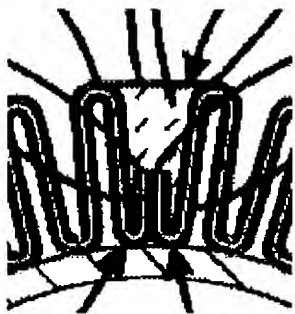
63) [as in claims 1, 10, 53, 55-56, 64-65]. Kahlbaugh also teaches fibers with the “Reemay” trademark, as in the applicant’s specification; preferred arrangements having a pleat density of 1-

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15 pleats/per diameter inch (col. 25, lines 10-16); and an example filter construction consisting of a 3-layer pleated media of micro-glass fibers that demonstrates the superiority over a cellulose-type media (see Experiment 4, col. 36) [as in claim 2]. It is considered that it would have been obvious to one ordinarily skilled in the art at the time of the invention to have the pleated multi-layer media of Kahlbaugh as the media of MacDonnell, since Kahlbaugh teaches the benefit of a filter media that can be specifically configured and constructed to provide relatively long life in relatively efficient systems (col. 7, lines 9-13), e.g. the filter can have an efficiency of 99% in fuel filtering systems (col. 29, lines 40-45).

Kahlbaugh also teaches that each coarse layer sandwiching a fine fiber layer is no greater than 0.030 inches (col. 15, lines 30-35) and preferably .001-.010 (col. 3, lines 55-57)[as in claim 54 and 56]. Since the middle coarse layer 31 can be considered the filtration layer sandwiched between the outer layers 31, the claimed ranges of claim 3 are also taught.

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over MacDonnell in view of Kahlbaugh, as applied to claim 1 above, and in further view of Zraik (U.S. 5,762,796) and Ganzi (U.S. 4,512,892).



As shown in figure 2, Zraik teaches an adhesive bead 72 for encapsulating the distal ends of the end pleats. It is considered that it would have been obvious to one ordinarily skilled in the art at the time of the invention to have the distal ends of the modified MacDonnell to be configured as in Zraik and to include the adhesive bead thereof, since

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Zraik teaches the benefit of preventing leak paths from forming across the seal when the filter element is under pressure (col. 2, lines 39-41) even when the filter includes multiple layers (col. 5, lines 28-31).

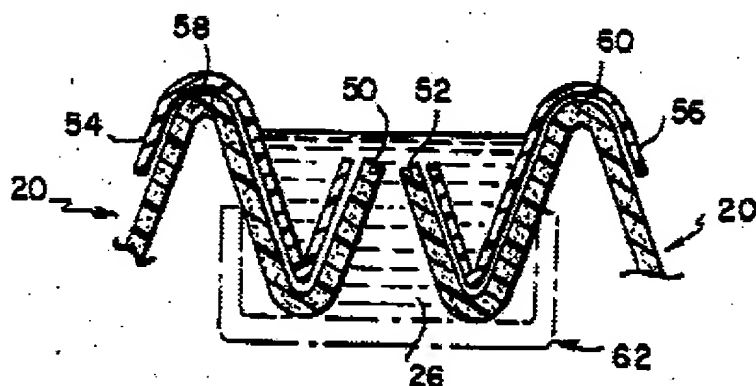


FIG. 13

Ganzi teaches a liquid sealer that extends radially between the end pleats [as in claim 7]. It is considered that it would have been obvious to one ordinarily skilled in the art at the time of the invention to have the adhesive the modified MacDonnel to

extend radially between the pleat ends—as in Ganzi—since Ganzi teaches the benefit of the sealer penetrating the membrane pores to *assure* a fluid-tight seal (col. 5, lines 1-4).

4. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over MacDonnell in view of Kahlbaugh, as applied to claim 2 above, and in further view of Miller et al. (U.S. 5,552,048). As shown in figure 9 and explained in col. 11, line 59 to col. 12, line 6, Miller teaches his exoskeleton to be made of a polymeric mesh (thermally-bondable) that is heat-bonded to his filter pleats. It is considered that it would have been obvious to one ordinarily skilled in the art at the time of the invention to have the exoskeleton of MacDonnell, as modified by Kahlbaugh to be made of the material as in Miller, since Miller teaches the advantage of not requiring adhesive, which would save material costs and simplify manufacture. Miller doesn't

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teach the claimed grid size of claim 4, but such would have been obvious to the skilled man and depends upon “the properties of the fluid to be filtered, the flow rate, and other factors” as taught by Miller in col. 11, lines 63-65.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over MacDonnell in view of Kahlbaugh, and Miller, as applied to claim 4 above, and in further view of Zraik (U.S. 5,762,796) and Ganzi (U.S. 4,512,892). Zraik and Ganzi have been explained above and teach the side seam that comprises the adhesive bead encapsulating all of the layers in the distal ends of the end pleats of claim 6. Reasons for which one would modify the references were given in the rejection of claim 7 above.

6. Claims 26, 39-41, 44-46, 52, 59 and 61-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over MacDonnell ‘475 in view of Miller. MacDonnell teaches the longitudinal pleats and outer support screen bonded to the pleats as in claim. Though MacDonnell doesn’t teach the support 18 to include a seam allowance, he teaches outerwrap 14 to include a seam allowance 20 (figure 3) such that would skilled in the art would know to include a seam allowance when manufacturing the element when the support 18 is initially in sheet form. As for the support being the longitudinal length of the element, such is within ordinary skill when the filter is to operate under conditions (e.g. flow rate) wherein full support along the axial length of the filter is necessitated. MacDonnell doesn’t teach the support to be thermally-bonded to the pleats. However, such is known in the art of Miller, as explained above. Miller also teaches the concept of overlapping (figure 6) and extending the support the full axial length. It is considered

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that it would have been obvious to one ordinarily skilled in the art at the time of the invention to have the exoskeleton of MacDonnell to be thermally-bonded to the pleats thereof as in Miller, since Miller teaches the advantage of not requiring adhesive, which would save material costs and simplify manufacture. It is also considered that it would have been obvious to one ordinarily skilled in the art at the time of the invention to having the support of MacDonnell to extend the entire axial length and to have overlapping (a seam allowance) as in Miller in order to have the benefit of provide adequate support for the filter element during operation. The grid configuration for the support screen of claim 52 is shown in figure 4 of MacDonnell and the 50% open flow area is obvious in view of MacDonnell which desires "full flow" therethrough. For claims 46 and 52, it would have been obvious to switch the order of the filter layers, such that netting of MacDonnell is attached to the radially inner peaks instead of the outer peaks since Miller teaches the benefit of alternately using the filter for radially inner to outer flow (col. 12, lines 7-22). Since MacDonnell in view of Miller teaches all the structural limitations of claims 46 and 52, the resulting configuration would be sufficiently supported without a central support tube, as taught by the applicant. Upon modification, the lateral seam of support 18 would extend parallel to the longitudinal axis of the filter media and would itself be heat-fused [as in claims 40-41]. Claim 44 is a process limitation but it is pointed out that it is obvious for the sheet material 18 to be rectangular in shape before wrapping the element, in order to form the resulting cylindrical sheet. As for claim 26, the relative spacing between e.g. the longitudinal screen cords of support 18 and the pleat spaces thereof is considered to be within ordinary skill in view of Millers teaching that gird size is chosen depending upon "the properties of the fluid to be filtered, the flow rate, and other factors" as taught by Miller in col. 11, lines 63-65.

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7. Claims 42-43, 60 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over MacDonnell '475 in view of Miller and in further view of Wylie et al. (U.S. 6,331,223). Wylie teaches a screen material that is made of PVC coated fiberglass (col. 1, line 66 to col. 2, line 6. It is considered that it would have been obvious to one ordinarily skilled in the art at the time of the invention to have the modified screen of MacDonnell to be made of the material of Wylie, since Wylie teaches the benefit of a screen material that is heat-fused and that is most popular (which would have the benefit of likely availability).

Response to Arguments

8. Applicant's arguments filed 1-24-2005 have been fully considered but they are not persuasive because of the following reasons:

- Despite applicant's remarks to the contrary, the purpose of the netting 18 of MacDonnell is to gang the pleats together to prevent a collapsed condition wherein a collapsed pleat contacts and blocks the filter surface of the next adjacent pleat that leads to serious loss in filter capacity (col. 8, lines 42-46). The netting is attached in a relaxed but *slack-free* mounting such that when a pleat is in danger of the aforementioned collapsed condition, tension is transmitted to the adjacent pleats 13A-13D and a positive return movement is effected to the collapsing pleat (col. 4, lines 45-55; col. 8, lines 26-66). Applicant's argument that the netting is not an exoskeleton because it doesn't support the pleats is not convincing. Does applicant believe that the claimed intended use of the exoskeleton "to support the pleats in an appropriately spaced and non-collapsed condition" in claim 1 means that pleat is incapable of any movement or flexing during use of the filter regardless of operating pressure? If so,

such is not supported by applicant's specification. Most particularly, the collapsed condition applicant wishes to prevent is deformed pleats (folded-over and/or bunched against one another)¹—which is the same goal as MacDonnell. Further evidence that the netting exostructure provides support to the pleated filter material is found in col. 9 of MacDonnell, which teaches that because of the netting, operating pressures of 125 psi rather than the conventional 60 psi are possible before a bypassing condition is necessary. In addition, nothing in Kahlbaugh gives reason to be that the layered, pleated filter structure thereof would destroy the operation of MacDonnell nor the flexing operation therein. Rather, it is contended that MacDonnell would benefit from the enhanced durability and efficiency taught by Kahlbaugh.

- The above also applies to applicant's arguments concerning the rejection using MacDonnell in view of Miller. In addition, applicant argues that it is not clear if the Miller mesh would accomplish the intended tension-transmitting function of the MacDonnell netting. This is not found convincing since upon modification the skilled man would preserve the tension-transmitting function by using the same relax but slack-free mounting taught by MacDonnell. In this respect, it is also pointed out that Miller was relied upon for his teaches of thermal bonding, instead of using an adhesive. Concerning claims 46 and 52, the limitation of the exoskeleton being attached to the inner peaks rather than the outer peaks is obvious in view of the teachings of Miller in col. 12.

¹ Page 2, lines 2-3.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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10. Contact Information:

- Examiner Mr. Terry K. Cecil can be reached at (571) 272-1138 at the Carlisle campus in Alexandria, Virginia for any inquiries concerning this communication or earlier communications from the examiner. Note that the examiner is on the increased flextime schedule but can normally be found in the office during the hours of 8:30a to 4:30p, on at least four days during the week M-F.
- Wanda Walker, the examiner's supervisor, can be reached at (571) 272-1151 if attempts to reach the examiner are unsuccessful.
- The Fax number for this art unit for official faxes is 703-872-9306.
- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Mr. Terry K. Cecil
Primary Examiner
Art Unit 1723

TKC
April 14, 2005